

**REMARKS**

The present amendment is filed in response to the Office Action dated May 11, 2010, finally rejecting pending claims 1-6, 8-15, 17-27, and 32.

**I. Claim Amendment:**

In order to emphasize the patentable distinctions of applicant's invention over the prior art, claims 1, 27, and 32 have been amended to recite a construction board having a smoothness such that the surface texture of the fiber facer does not remain visually perceptible under obliquely incident light after the facer is painted.

Support for the amendment of claims 1, 27, and 32 is provided by the specification; particularly at page 4, lines 15-18. Consequently, no new matter has been added.

**Discussion:**

Applicant' invention, as recited by claims 1-6, 8-15, 17-27, and 32, as amended, is directed to a paintable gypsum or hydraulic board. In various embodiments, the board exhibits a combination of desirable structural and functional features that render it fire resistant and paintable or otherwise able to be given an aesthetically pleasing finish after installation with a minimum of surface preparation required. The mat has a high permeability, permitting easy extraction of excess water ordinarily present during slurry-based manufacture of gypsum or other hydraulic set board. Surprisingly and unexpectedly,

gypsum board faced in accordance with the invention with the present nonwoven glass fiber mat, wherein the fibers consist essentially of chopped glass fibers having an average fiber diameter ranging from about 9.5 to 12.5  $\mu\text{m}$  and an average fiber length ranging from about 6 to 12 mm, has a smoother surface than boards made with mats employing either larger or smaller diameter fibers. The smoothness of the surface permits the board to be painted directly, without the need for a skim coat of plaster, that heretofore has been required in order for the underlying surface texture of the mat not to be perceived after painting. Elimination of that skim coat markedly improves the efficiency of installation and ultimate finishing of the board, as required for most construction projects.

It is especially surprising and significant that the aforementioned 9.5 to 12.5  $\mu\text{m}$  fibers result in smoother board than that obtained with fibers having a smaller diameter. It is likewise surprising and unexpected that a gypsum board having a facer wherein the average glass fiber diameter is 9.5 – 12.5  $\mu\text{m}$  and the average fiber length is 6 – 12 mm is smoother than board faced with mat having the same diameter but fiber length of 19 mm (3/4").

The mat used in the present construction board further has a high permeability of at least 300 cfm/ft<sup>2</sup> measured by the Frazier test. This high permeability facilitates the extraction of water needed in the ordinary process by which the board is formed, wherein the gypsum or other cementitious material is originally delivered onto facer sheets as an aqueous slurry that is thereafter dried.

Appreciation is expressed for the Examiner's withdrawal of the previous obviousness-type double patenting rejection.

**II. Rejection under 35 USC §112, first paragraph:**

Claims 1-6, 8-15, 17-27, 31, and 32 were rejected under 35 USC 112, first paragraph, as failing to comply with the written description requirement. The Examiner has alleged that the claims contain subject matter not described in the specification in a way that reasonably conveys to a skilled person that the inventor had possession of the invention at the time the application was filed. In particular, the Examiner has contended that the limitation that the surface texture of the claimed board does not remain perceptible after the board face is painted is not supported.

Applicant respectfully disagrees. In particular, applicant's gypsum board is taught as being "readily finished in an aesthetically pleasing way, using paint or other wall covering systems." (Abstract, lines 6-7). On the other hand, prior art gypsum board having non-woven fiber facers is said to have the "undesirable" feature of "surface roughness" that renders it "difficult to finish satisfactorily by normal painting, because the texture of the mat remains perceptible through the paint." (Page 4, lines 5-9). Applicant further characterizes the understanding of the prior art that some of the features defining the surface topography governing the smoothness of gypsum boards can be quantified somewhat by image analysis techniques, but that visual comparison under obliquely incident light is fully adequate for comparing relative smoothness. (Page 4, lines 15-18.) Prior-art, fiber mat-faced gypsum boards are further characterized as having "...defects and an underlying fibrous texture [that]

remain[s] perceptible and aesthetically unappealing" even after painting. "As a result, a uniform, smooth finish can be achieved only in conjunction with a prior ameliorative treatment." (Page 4, lines 20-23). A skim-coating and sanding are said to be exemplary of the necessary treatment. (Page 4, lines 23-26.) Taken together, these passages establish first that prior-art, fiber mat-faced gypsum boards lack such a surface that is sufficiently smooth to be painted.

Applicant's gypsum board, on the other hand, is taught to have "a smooth, uniform surface that readily accepts paint or other surface treatments to provide a pleasing aesthetic appearance." (Page 6, lines 9-11.)

Applicant submits that the "paint" referenced at page 6, line 10, would be understood by a person having ordinary skill in the art as being the same paint in view as used in the "normal painting" of prior art gypsum board discussed at page 4, line 8 and the "paint" of page 4, line 25, i.e., paint of the types conventionally used in the art for finishing conventional gypsum board. clear teaching of the present specification compels the understanding that the and thereafter not exhibit a perceptible texture arising from the mat surface, and second that the novel gypsum boards of the invention do possess such a smooth surface.

Applicant further submits that the "pleasing aesthetic appearance" of the present gypsum board taught at page 6, line 11, would be understood by a skilled artisan as defined by the negation of the characteristics of prior art gypsum board, which lack a "pleasing

aesthetic appearance," in that surface asperities and underlying fibrous texture remain perceptible even after painting.

Consequently, applicant traverses the Examiner's contention, i.e. that the specification as filed does not support the claim feature of a smoothness sufficient such that the surface texture of the painted facer is not perceptible, is not established, contravening the written description requirement of 35 USC 112, first paragraph, and the resulting contention that new matter has been added.

Applicant's intention and understanding – that painting the present board obscures the underlying surface defects and surface texture – is unmistakable in view of the following teaching:

Even after prior art boards are coated with substantial amounts of paint in multiple coats, the texture of the facing mat in many instances remains visible, making the surface aesthetically unpleasing for many applications. By way of contrast, the present boards may be finished to provide an aesthetic and functional surface with far less paint and the associated labor to prepare the surface and apply the paint or other desired finish..."

(Page 8, lines 8-14)

Applicant respectfully maintains that it is settled law that claim language need not replicate the specification *in haec verba*. *New Railhead Mfg., L.L.C. v. Vermeer Mfg. Co.*, 298 F.3d 1290, 63 USPQ2d 1843, 1847 (Fed. Cir. 2002) (quoting *Crown Operations Int'l, Ltd. v. Solutia Inc.*, 289 F.3d 1367, 1376, 62 USPQ2d 1917, 1922 (Fed. Cir. 2002)). See also MPEP §2163. It is submitted that by the immediate juxtaposition and contrast drawn in the the language of page 8, lines 8-14, applicant clearly evidences possession of the invention now recited by claims 1, 27, and 32.

The Examiner has alleged that applicant's description of painted, prior-art, fiber mat-faced gypsum boards as "aesthetically objectionable" rests on the subjectivity of aesthetics. While applicant agrees that aesthetic judgments vary, he relies on the axiom that an applicant is permitted to be his own lexicographer. Further, he has observed that in the marketplace, at least some persons consider it unaesthetic for finished gypsum board to exhibit perceptible texture. Clearly, the present claim language does not rely on the aesthetic question of whether or not texture is objectionable. Rather, the present claim language recites a structural limitation that is defined by a specific test of visual inspection under illumination by obliquely incident light. The test demarks the allowable smoothness of the present board by determining whether or not there is any visually perceptible surface texture arising from the mat facer.

Accordingly, reconsideration of the rejection of claims 1-6, 8-15, 17-27, 31, and 32 under 35 USC 112, first paragraph, as failing to comply with the written description requirement, is respectfully requested.

### **III. Rejection under 35 USC §112, second paragraph:**

Claims 1-6, 8-15, 17-27, 31, and 32 were rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Examiner has alleged that the scope of claims 1-6, 8-15, 17-27, 31, and 32 is unclear, inasmuch as the specification does not provide characteristics and/or measurable

differences that describe a "smoothness that is sufficient to permit the board to be directly paintable" and a smoothness sufficient to cause the painted surface not to exhibit perceptible texture. Elsewhere, (page 5 of the instant office action) he couches the rejection as based on a lack of objective and/or quantitative characteristics that characterize smoothness. To the contrary, applicant points to the above-quoted recitations of the specification, which together indicate the deficiency of prior art fiber-faced construction boards, in which "defects and the underlying fibrous texture remain perceptible and aesthetically unappealing" even after painting, and the definition of the properties of the present mat and board by the negation and contrast with the characteristics exhibited by prior art boards. The Examiner further points to US Patent 5,572,862 to Ellis, for the proposition that paints of different sorts have different effect on surface properties. However, applicant respectfully submits that a skilled person would not look to Ellis in the present instance. Clearly, applicant has in view the "normal painting" used for coating gypsum boards. *See* the specification at page 4, line 8. By way of contrast, Ellis is directed to a special purpose material "consisting of a paint-like slurry of three separate but compatible and mutually synergistic co-bonding systems" used as a fire-barrier coating. (Abstract, lines 4-6, emphasis added). Clearly, such a material is not a material used for normal painting of gypsum board.

Applicant respectfully traverses the Examiner's contention as conclusory and unsupported by any pertinent evidence that contravenes the specification's teaching concerning both optical measurements and visual characterization of smoothness. Attention is drawn to the specification at page 4, lines 15-18, in which optical measurements are taught

to permit characterization of some of the surface defects contributing to lack of smoothness, but further teaching that visual comparison is more than sufficient to characterize the present smoothness.

Accordingly, it is submitted that the skilled person would recognize that the present claim language is in fact definite in characterizing the requisite smoothness and paintability as discernable by observing whether or not the surface is smooth enough that the underlying fibrous texture of the mat facer is not readily perceived after gypsum board employing that facer is painted.

Accordingly, reconsideration of the rejection of claims 1-6, 8-15, 17-27, 31, and 32 under 35 USC 112, second paragraph, as being indefinite, is respectfully requested.

#### **IV. Rejections under 35 USC §103(a):**

Claims 1-6, 8-15, 17-19, 21-24, 26-27, and 32 stand rejected under 35 USC 103(a) as being unpatentable over US Patent 5,772,846 to Jaffee ("Jaffee '846"), which provides a thermoformable nonwoven fibrous mat having properties said to make it particularly suited for a facer on insulating gypsum board.

Applicant respectfully submits that Jaffee '846 fails even to recognize the possibility of a gypsum or like construction board that is faced with a non-woven, glass-fiber mat, yet has a surface that smooth enough to be directly paintable without the need for extensive surface preparation, such as the supplemental application of a skim coat of plaster or similar material. Absent this recognition, a skilled artisan would not be led to the present facer

materials for gypsum or other hydraulic set board. Applicant further notes that Jaffee '846 is devoid of any disclosure or suggestion of a mat having the permeability of at least 300 cfm/ft<sup>2</sup> measured by the Frazier test, as required by amended claims 1, 27, and 32.

The Examiner has admitted that Jaffee '846 fails to teach the particular ranges of average fiber diameter between 9.5 and 12.5  $\mu\text{m}$  and the average fiber length between 6 and 12 mm, as required by applicant's claims. Applicant respectfully submits that it is not proper to combine individual teachings "cherry-picked" from the Jaffee '846 reference. Specifically, applicant's claims require a particular fiber diameter range and a particular length range in combination.

Applicant continues to maintain that it is this combination that gives rise to surprising and unexpected results, evidenced both in comparative examples set forth both in the original specification and in two Declarations Under 37 CFR 1.132 by Alan M. Jaffee, the first being dated April 26, 2006 and entered May 3, 2006 and the second entered October 24, 2006.

The Examiner has pointed to certain disclosures in Jaffee '846 regarding fiber diameter and length, and has relied on *In re Aller*, 220 F.2d 454, 456; 105 USPQ 233, 235 (CCPA 1955) for the proposition that optimization of the fiber diameter and length is not inventive. He particularly states that "one would have been motivated to optimize the fiber diameter, length, proportion of glass fibers and basis weight in order to create a composite with the desired properties such as flexibility and strength while minimizing skin irritation during installation." Office Action at p. 6.

Applicant respectfully maintains that reliance on *Aller* in this instance is misplaced. In *Aller*, the court elucidated the concept of criticality in the context of ranges:

Under some circumstances, however, changes such as these may impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art. Such ranges are termed 'critical' ranges, and the applicant has the burden of proving such criticality.

[*In re Aller*, 220 F.2d 454, 456; 105 USPQ 233, 235, (CCPA 1955, citations omitted)]

To begin, nothing in Jaffee '846 pertains in any way to smoothness, so there is no indication which, if any, of the multiple variables of fiber characteristics and other mat parameters ought to be varied to effect the purported optimization. Nothing instructs the artisan how to "dial up" smoothness. Even further, applicants' selection of a particular fiber constituents cannot rightly be regarded as a mere improvement in degree, because even the possibility smoothness sufficient to permit direct paintability and result in imperceptible mat structure was not a property ever contemplated for mat-faced gypsum board in the prior art, or by Jaffee '846. On the other hand, the Examiner's own proffered motivation for carrying out the optimization was to alter very different properties of the non-woven fiber mat. Thus, even if there were, *arguendo*, motivation to improve certain other properties, there is no basis for concluding that the resulting mat and board would exhibit improved smoothness.

Further and as noted above, Jaffee '846 fails to disclose or suggest the advantageously high permeability of applicant's mat, and the production advantages ensuing therefrom. The Examiner has contended that the claimed permeability would naturally flow from the teaching of the prior art, alleging that "the use of like materials (a gypsum layer and two face layers

wherein the first facer compris[es] a nonwoven glass fiber web and resinous binder, wherein the glass fibers have an average diameter and length within the claimed ranges) [] would result in the claimed properties.” Office Action at 10. Applicant respectfully disagrees, and points to US Patent 4,637,951 to Gill as exemplary of mat that does not exhibit the requisite permeability, Accordingly, it cannot fairly be concluded that the property of air permeability of at least 300 cfm/ft<sup>2</sup> measured by the Frazier test is inherent. *See, e.g.*, Gill’s example 3 at col. 6, lines 1-10, disclosing a Frazier air permeability of 220 cubic feet per second (clearly a typographical error, cubic feet per minute having been intended). Contrary to the Examiner’s argument that unsupported arguments are not a substitute for evidence, applicant points to Gill as clearly pertinent, objective evidence. Thus, applicant respectfully submits that reliance on *In re Fitzgerald* is misplaced. Moreover, applicant is unaware of any proper legal basis for the contention that applicant must show that the facer of the prior art is necessarily outside the scope of the claimed invention. Office Action at 23.

The Examiner has proffered a motivation for modifying (allegedly, “optimizing”) the composition of Jaffee ‘846, namely to provide improved flexibility and strength and minimized skin irritation. However, he has not articulated any basis that would establish that applicants’ choice of fiber dimensions would in fact accomplish these objectives. To the contrary, as set forth in the specification at page 8, lines 2-3, and in the May 3 Jaffee Declaration at ¶17, a skilled artisan seeking smoothness would have been led to smaller diameter fibers, and not to the intermediate diameter fibers shown herein to provide improved

smoothness. Thus, an artisan motivated as the Examiner purports, would not be led to applicants' composition.

Applicant further counters the Examiner's apparent view that the recitation of the smooth surface after painting in the present claims is merely a statement of intended use. Rather, this limitation delineates a structural property, albeit recited in functional terms. Applicant respectfully objects to the following statement at page 9 of the present office action:

For example, the limitation is interpreted as *when* the first face is painted, the surface texture will not remain perceptible. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. (emphasis original)

Applicant instead maintains that the language of claims 1, 27, and 32, to which the Examiner alludes is not a statement of intended use. Rather, it defines a test that accomplishes exactly what the Examiner says is absent – the definition of a structural difference that distinguishes the present smooth board from prior art boards. Consequently, the claim language defines not an intended use, but a functional test revealing physical structure.

The Examiner's following statement in the same paragraph alleges that it would have been obvious to a killed person to form the gypsum board of claims 1, 27, and 32, based on motivation to attain a smooth surface. Applicant respectfully submits that the Examiner has merely replicated applicant's own statement, clearly marking it as impermissible hindsight, since nothing of record establishes even the possibility of attaining the requisite smoothness,

let alone motivation to do so. The present office action further fails to establish any motivation for the selection of applicant's particular fiber composition and permeability based on other factors.

Applicant also traverses the Examiner's reliance on the BPAI's *sua sponte* position that Jaffee has not established that testing using camera images, software and visual observation is an art-recognized test or is reliable. Applicant is unable to recognize any evidence that the Examiner has cognized these references, despite the position set forth by applicant in his previous response. It is respectfully submitted that the Examiner is obliged to consider the record in its totality, which now includes additional references concerning the use of optical measurements to characterize surface smoothness/roughness that were not before the BPAI at the time of its decision. In particular, the pertinence of the Tsalas thesis, papers by Li and Torrance, Schmitt Industries, and Chen et al. were argued in applicant's previous response at pages 17-19.

Applicant further maintains that the BPAI decision evidences a misreading of the May 3 Declaration with respect to the meaning of the average intensity and standard error. As set forth at ¶12, each of the samples tested was illuminated at grazing incidence by the same light. Differences in the reported intensity for the different samples indicated the different amount of light intercepted by camera 5. The image acquired by camera 5 was divided into digitized pixels, so that it could be analyzed numerically. The reported intensity was determined by averaging the light intensity detected in each pixel, while the variability was determined by the standard error, calculated in a conventional way from the ratio of the

standard deviation of the population of pixel intensities divided by the average intensity. Contrary to the impression seemingly set forth in the BPAI decision, the average intensity is not a variable controlled by the experimenter. Rather, the experimental observation of differences in the average intensity arises from actual variations in the reflectivity of the different samples under a given lighting condition, and thus from differences in surface roughness, as stated in ¶15 of the May 3 Declaration. The data of ¶14 show that either increasing (Samples 1 and 4) or decreasing (Sample 3) average fiber length from 12 mm increases the standard error. Likewise, either increasing or decreasing average fiber diameter from 11  $\mu$ m also increases the standard error. Mr. Jaffee states that a skilled person would understand the increase in standard error to reflect a rougher surface. It is respectfully submitted that the BPAI has substituted its own reading for that of Mr. Jaffee without warrant.

In view of the amendment of claims 1, 27, and 32; the cancellation of claim 31; and the foregoing remarks, it is submitted that claims 1-6, 8-15, 17-19, 21-24, 26-27, and 32, as amended, are novel and unobvious over Jaffee '846.

Accordingly, reconsideration of the rejection of amended claims 1-6, 8-15, 17-19, 21-24, 26-27, and 31-32 under 35 USC 103(a) as being unpatentable over Jaffee '846 is respectfully requested.

Claim 13 was rejected under 35 USC 103(a) as being unpatentable over Jaffee '846 in view of USP 6,187,697 to Jaffee ("Jaffee '697"), which discloses a multiple layer fibrous

nonwoven mat having a body portion and a surface portion. The body portion is said to comprise a mass of nonwoven fibers, with or without particles, bonded together with a resin binder; the surface portion contains fibers and/or particles bonded together with the same said resin binder, the surface portion being substantially-different than the major or body portion of the nonwoven mat. The body portion makes up a major portion of the basis weight (weight per unit area) of the mat while the surface portion makes up a minor portion of the basis weight of the mat. The fibers used for the surface portion are preferably shorter than one-quarter inch and longer than 100 microns.

Applicant respectfully maintains that Jaffee '697 fails to cure the deficiencies of Jaffee '846 in failing to disclose or suggest the subject matter of claim 1, from which claim 13 depends, for at least the reasons set forth above.

Accordingly, reconsideration of the rejection of amended claim 13 under 35 USC 103(a) as being unpatentable over Jaffee '846 in view of Jaffee '697 is respectfully requested.

Claim 20 stands rejected under 35 USC 103(a) as being unpatentable over Jaffee '846 in view of US Patent 6,365,533 to Horner, Jr., et al., which relates to a low fiber, pliable facer suitable for use in insulation board manufacture.

Applicant continues to maintain that a skilled person would not have been motivated to look to Horner in contemplating gypsum board construction, and respectfully disputes the Examiner's characterization of the arguments made as "attacking the references individually." The mere use of the term "facer" by Horner is insufficient to establish that any facer suitable

for Horner's board, which clearly is not a gypsum or other hydraulic set board, is alternatively suitable for a gypsum board. Nothing in the present rejection establishes that what may be conventional for the foamed core insulation boards contemplated by Horner is, any way, conventional for the present gypsum board.

Applicant respectfully submits that the statement "Applicant does not provide evidence that a skilled person would not have been motivated to look to Horner in contemplating gypsum board construction" as being legally untenable. Clearly, it is the Examiner's obligation to establish such motivation, and to refute applicant's arguments to the contrary. In the present instance, it is submitted that the Examiner's combination is made on nothing more than an argument from silence – that there can be motivation even if Horner is silent as to gypsum board, even though the inherent requirements of the mat provided by Horner are contradictory to the requirements for making gypsum board, as established by applicant's remarks.

For these reasons, and those set forth above, it is submitted that the proposed combination of Jaffee '846 and Horner, Jr., et al. does not disclose or suggest the gypsum board recited by present claim 20.

Accordingly, reconsideration of the rejection of claim 20 under 35 U.S.C. 103(a) as being obvious over the combination of Jaffee '846 and Horner, Jr., et al. is respectfully requested.

Claim 25 was rejected under 35 USC 103(a) as being unpatentable over Jaffee '846 in view of US Patent 7,056,582 to Carbo, which discloses acoustical tiles, also known as acoustical panels, ceiling tiles, or ceiling panels, that are said to inhibit the growth of fungus, bacterial and other micro-organism.

Applicant respectfully maintains that Carbo, like Jaffee '846, fails even to recognize the possibility of a gypsum or like construction board that is faced with a non-woven, glass-fiber mat, yet has a surface that smooth enough to be directly paintable without the need for extensive surface preparation, such as the supplemental application of a skim coat of plaster or similar material and provides the level of permeability recited by claim 1, from which claim 25 depends.

For at least the reasons set forth hereinabove, it is submitted that Jaffee '846 fails to disclose or suggest the claimed invention. Clearly, Carbo, whether taken singly or in combination with Jaffee '846, does not remedy the lack of disclosure or suggestion of a mat imparting direct paintability to the gypsum board made with the present mat and high permeability.

Accordingly, reconsideration of the rejection of claim 25 under 35 U.S.C. 103(a) as being obvious over the combination of Jaffee '846 and Carbo is respectfully requested.

V. Conclusion:

In view of the amendment of claims 1, 27, and 32 and the foregoing remarks, it is respectfully submitted that the present application has been placed in allowable condition. Reconsideration of the rejection of claims 1-6, 8-15, 17-27, and 32, entry of the present amendment, and allowance of the present application are earnestly solicited.

Respectfully submitted,  
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